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VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION
ST. CROIX, VIRGIN ISLANDS, U. S. A.
Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION

1928

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Issued October, 1929

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VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION, ST. CROIX

[Under the supervision of the Office of Experiment Stations, United States Department of Agriculture]

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ST. CROIX, VIRGIN ISLANDS, U. S. A.

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REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION, 1928

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REPORT OF THE DIRECTOR

By J. B. Thompson

The agricultural and economic situation in St. Croix was better at the close of the year covered by this report than it has been since the decline in the price paid for sugar in 1920–21. Rains throughout the summer of 1927 stimulated cane planting, resulting in a good yield and providing employment for all desiring it. An increase of 50 per cent in the wages paid field laborers not only helped to improve their condition in particular, but also caused more money to be put into circulation than formerly, and thus improved economic conditions in general. Further change was brought about in the labor situation through the importation of plantation laborers from Porto Rico. During the past 18 months (January 1, 1927, to June 30, 1928) several hundred workers from Porto Rico have come to St. Croix.

A common complaint against the laborers of St. Croix has been their almost universal practice of absenting themselves from work on Saturdays, often on Mondays, and frequently on other work days. In an effort to improve the situation the station six years ago decided upon the plan of paying its laborers semimonthly, that is, on the fifteenth and the last day, respectively, of each month. To each field laborer who works every day in the month, excepting of course Sundays and legal holidays, a bonus of 5 cents per day is given. This method has proved to be of benefit both to laborers and employer. The laborers are encouraged to work regularly and are paid

for a greater number of days at a better wage than was the case under the old method. The station, on its part, is able to plan its work in advance with the certainty that the labor force will not be seriously diminished by a number of absentees. It is significant that of 204 possible bonuses—that is, 17 laborers for 12 months—139 were paid during the year. Of the total field force, the average number of men per month who worked every day was 68 per cent.

The work at the station was continued along the same general lines as in previous years. Some improvements were made to the station buildings and equipment. In connection with animal husbandry, milk and butterfat production records were again kept of native, grade, and Guernsey cows. A comparison of the egg-producing qualities of the native hen and the Single Comb White Leghorn breed indicated an advantage in favor of the latter in both numbers and size of eggs. Truck-crop tests were conducted on a relatively large scale, with the view to determining the practicability of marketing the produce in New York City.

The work of the agronomist included field and laboratory comparisons of more than 60 varieties of sugarcane. Nine new kinds were introduced and several others are being grown in quarantine in St. Thomas pending their shipment to St. Croix. Approximately 4,532 new seedling varieties have been developed within the past three years, and 1,182 of these seedlings are still under test.

In the horticultural division considerable progress was made in the introduction and establishment of valuable plant species. Work was continued on the fig orchard previously planted, and a serious infestation of the pustule scale was controlled by means of a 2 per cent paraffin-oil emulsion. Several introduced varieties of the avocado were under observation, and the trees made satisfactory growth.

The agriculturist, who is carrying on agricultural extension activities in St. Thomas and St. John, made commendable progress in the work of encouraging the more general planting of food crops. An increase in the local supply of vegetables is already noted. A community sirup mill has been put in operation in St. John, and one is soon to be installed in St. Thomas. A municipal nursery has been started in St. Thomas and, under the supervision of the agriculturist, the trees of the city parks and roadways, many of which have suffered from hurricanes and other troubles, have been pruned and treated to enhance their beauty and prolong their lives.

ANIMAL HUSBANDRY

CATTLE

Cattle breeding was continued without change. The registered Shorthorn bull, Government Clay Chief 1257318, which was imported as a calf in January, 1924, is still in service and the station herd now contains several of his progeny. (Fig. 1, A, B.) One of his first get, a heifer, dropped a calf on April 24, 1928. None of his sons has as yet been trained to the yoke.

The Guernsey bull, Geneva's Justice 113853 (fig. 1, C), which was received as a calf on July 3, 1924, has sired several calves. One registered Guernsey cow, Royal's Bess's Mavourneen 186183, died

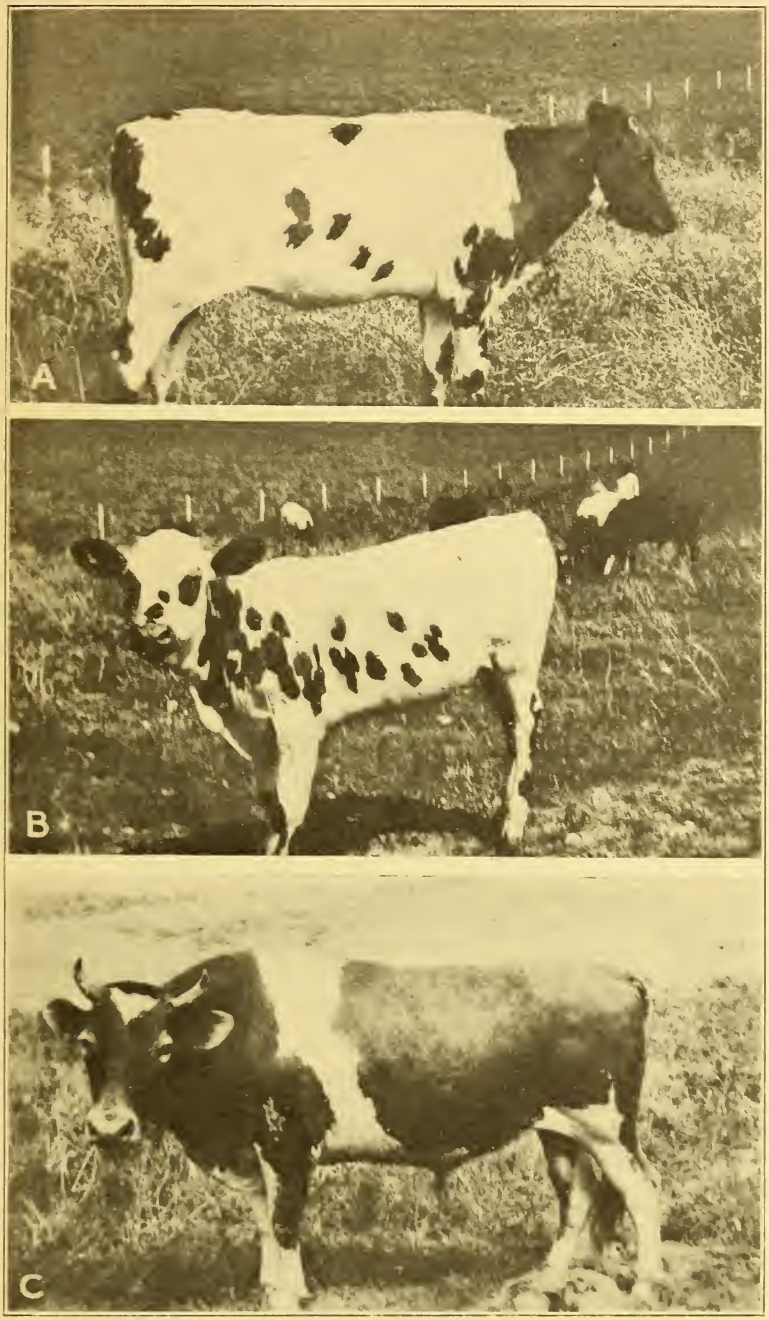

FIGURE 1.—A, B, Grade Shorthorn heifers, sired by Government Clay Chief 1257318; C, Guernsey bull, Geneva's Justice 113853

suddenly although apparently in good health after having been milked as usual on June 6, 1928. The two imported Guernsey cows, of which the above mentioned was one, have required more care and attention and have given less milk than has the average native cow in the station herd. It is still to be seen whether acclimatization will aid in adapting the island-born offspring of this stock to tropical conditions. Table 1 gives the milk and butterfat yields of eight cows for the year.

TABLE 1.—*Comparison of milk and butterfat yields of eight cows for the year ended June 30, 1928*

Cow	Length of time in milk	Total yield of milk	Total yield of butterfat
	Days	*Pounds*	*Pounds*
Blossom (native)	358	4,234	184.3
Berry (grade Holstein)	366	4,126	182.5
Mary (native)	234	3,625	140.0
Cherry (native)	245	2,478	101.3
Bess (Guernsey)	340	2,376	122.5
Alma (native)	107	2,248	79.1
Ellen (Guernsey)	366	2,088	92.0
Ruby (grade Shorthorn)	66	612	23.8

With the exception of a small quantity of concentrates given the Guernsey cows for a short period when pasturage was poor, the above-mentioned animals subsisted wholly on guinea-grass pasturage.

POULTRY

Egg production for the first laying year of Single Comb White Leghorn hens was compared with that of native fowls for a like period. There were 15 White Leghorn hens and 60 hens of the common native stock. The average production from native hens was 108.6 eggs weighing 10 pounds 5 ounces, and from the White Leghorns, 144.5 eggs weighing 16 pounds 1 ounce. In other words, the White Leghorn breed showed an increase of 33 per cent in number and 55.7 per cent in weight of eggs of annual production over the native hens. But, as is the case with the cattle, the native fowls are better able to withstand local climatic conditions than are introduced breeds. As compared with the native breed, the White Leghorn chick is difficult to raise and mortality among grown fowls of the imported breed is higher than among the native stock. Low production in the native stock is, presumably, due to an almost total lack of selective breeding. As a rule, hens of this class are inclined to frequent periods of broodiness, but occasionally individuals with good laying habits are to be found. This was indicated in the work mentioned above where the 5 highest records from a total of 60 gave an average of 166 eggs in the year (21 more than the average for the White Leghorn flock) weighing 16 pounds 1 ounce (the exact weight of the average yearly production of the White Leghorns).

The station flock was attacked by chicken pox, known locally as "yaws," but no deaths resulted from the disease. Serious losses were sustained through the depredations of the mongoose and large hawks.

SWEET POTATO WORK

Continual rains during the 1927 planting season combined with a program calling for an unusual amount of field work delayed sweet-potato planting. The 50 seedling varieties which are under test for the development of improved forms were planted late but failed to produce a crop because of subsequent dry weather. A second planting, made following temporary showers, met a similar fate. Planting material of all the seedlings was continued in the nursery so that further tests can be made.

BANANAS

Records have been kept throughout the year on a planting of Cavendish bananas. This work was begun by the planting of a selected area covering a 0.327-acre plat in October, 1925. Table 2 gives the yield from this planting by months for the fiscal year ended June 30, 1928.

TABLE 2.—*Yields of bananas from a 0.327-acre plat for the year ended June 30, 1928*

Month	Bunches	Hands	Fruits	Weight
1927	*Number*	*Number*	*Number*	*Pounds*
July	17	135	2,116	643⅞
August	16	142	2,259	797 1/16
September	20	191	3,180	1,007 1/16
October	10	99	1,705	525⅛
November	16	160	2,610	825⅜
December	28	284	4,985	1,525¾
1928				
January	26	268	4,563	1,262 5/16
February	15	153	2,569	683 7/16
March	25	241	4,088	1,120 5/16
April	22	207	3,299	899⅛
May	28	250	4,322	1,167⅛
June	13	114	1,971	455 1/16
Total	236	2,244	37,667	10,911⅞

The total yield of bananas for the year was 236 bunches weighing 10,911 pounds, which is equivalent to 720 bunches weighing 33,364 pounds, from an acre-plat. The average bunch produced during the year bore 155 fruits and weighed a little more than 46 pounds. Bananas should retail on the local market for at least $1 a bunch. Since much of the market supply is shipped in from other islands, a limited number of local growers should find the cultivation of bananas remunerative.

PAPAYAS

The papaya plantings which were made in 1925–26 and reported upon in the last annual report were destroyed because they had degenerated and become badly infested with the West Indian or white peach scale (*Aulacaspis pentagona*), and new plantings were started. These latest plantings included trees of both the Hawaiian variety and the Guam strain. Probably the greatest handicap to securing an adequate supply of papayas in the Virgin Islands is the very short average life of the papaya tree under local conditions. Scale is a serious enemy of the tree, and a bitter rot of

the fruit often associated with a bleeding or gumming of the trunk attacks them.

LATH-COVERED PROPAGATION-HOUSE WORK

The propagation of economic plants, exclusive of vegetable-garden varieties, was made a part of the duties of the director during the year. An addition to the lath-covered propagation house measuring approximately 2,400 square feet has been provided to handle the ever increasing volume of the work. A sand bench for the rooting of cuttings has proved to be very useful. Several new plant species, some of economic and others of purely ornamental value, were introduced during the year, and large numbers of plants were grown for distribution. The distributions included 891 fruit trees, 9,434 hedge and ornamental plants, 103 palms, and 8,504 miscellaneous plants of economic importance. A row of "bread and cheese" (*Pithecolobium unguis-cati*), which was planted at the station in 1922, has developed into an attractive hedge, and has withstood long periods of extreme drought without the application of water. (Fig. 2, A.)

This species is used extensively as a hedge plant in St. Kitts and various other islands of the Lesser Antilles, but it has not previously been grown for this purpose in St. Croix. The beauty and density of growth of the plant when properly trimmed and its ability to withstand the hardships of the local recurrent dry seasons should soon make it a favorite here. It is attracting attention. Numerous requests for the seed or the plants have been received, and the station has distributed more than 8,000 of the plants. Several thousand more of the plants which are being grown in the lath-covered propagation house are now available for distribution. The nucleus of what it is hoped will eventually become a valuable and interesting plant collection has been started.

REPORT OF THE HORTICULTURIST

By Claud L. Horn

EXPERIMENTS WITH TRUCK CROPS

In cooperation with the municipal government of St. Croix, the horticulturist conducted experiments at the station to determine the possibility of profitably growing certain truck crops for marketing in New York. Plantings were made of tomatoes, eggplants, peppers, and Bermuda onions. The plantings occupied an aggregate area approximating 8 acres. The production of eggplants was unsatisfactory this year, due to a wet season and to poor soil drainage. The plants grew well but the fruits were small and decayed before reaching maturity. Peppers and onions each produced a fair crop, and in point of yield the tomatoes were quite satisfactory. Prices generally were low, however, and the returns did not cover the cost of production and marketing. The experiments yielded valuable data, and it is hoped that added experience and a better knowledge of shipping requirements will result in improvements assuring delivery of the crops in good condition. Five hundred and eighty-four standard 6-carrier type of crates of tomatoes were shipped,

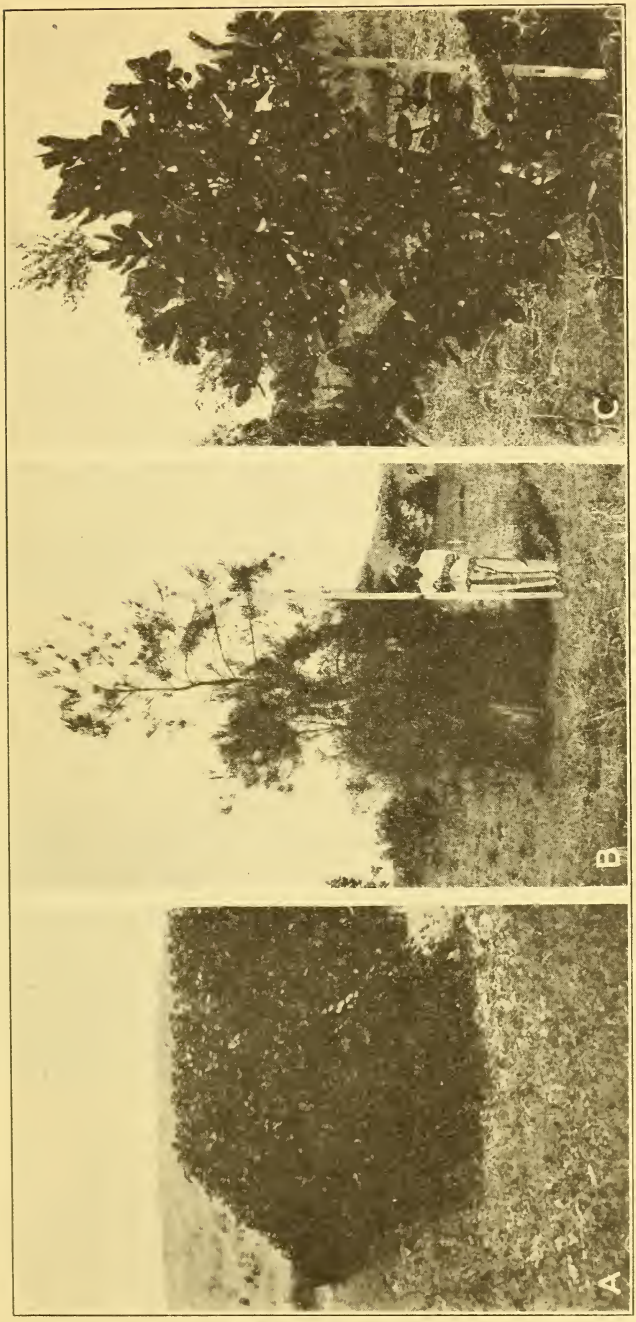

FIGURE 2.—A, An attractive hedge plant, "bread and cheese" (*Pithecolobium unguis-cati*); B, *Casuarina glauca*, 4 years old; C, *Calophyllum calaba*, 5 years old

and the total yield exceeded 250 crates of good marketable fruits per acre. Shipments were made between December 2, 1927, and January 31, 1928.

The work of producing for distribution a limited number of vegetable plants for the purpose of encouraging the more general planting of them was continued. Distributions during the year included 7,185 cabbage plants to 166 persons, 60 celery plants to 2 persons, 21,602 eggplants to 176 persons, 12 horseradish plants to 1 person, 70 lettuce plants to 2 persons, 512 onion plants to 4 persons, 668 parsley plants to 10 persons, 9,660 pepper plants to 122 persons, and 17,534 tomato plants to 143 persons.

ARBORETUM

In 1923 a plat of ground was set aside for use as an arboretum. At present the plat contains approximately 150 plants, both native and exotic, and roughly classified as fruits, ornamentals, timber, and miscellaneous species. As a group, the fruit trees have given disappointing results. None of them has made outstanding growth, and several have died. The 40 ornamental trees have as a whole made fair growth. *Plumeria alba*, *Bauhinia racemosa*, *Cassia siamea*, *Tecoma argentea*, and *Melia azedarach umbraculiformis* have all made very good growth. *P. alba*, with its beautiful clusters of fragrant white flowers, and *T. argentea* are the most attractive specimens in the group of flowering plants. The Texas umbrella tree (*M. azedarach umbraculiformis*) has suffered from attack by borers.[1] *B. racemosa* and *C. siamea*, with their light green foliage and stems, are making very satisfactory development. *Jacaranda ovalifolia*, which is normally an attractive foliage tree, has not made satisfactory progress. The 38 timber trees have as a whole grown well. *Casuarina stricta* has not thrived nearly so well as *C. glauca*. (Fig. 2, B.) *Tamarix articulata* has developed into a well-formed tree 11 feet high, is very ornamental, and is recommended for use as a windbreak. The eucalyptus trees have made exceptionally rapid growth, *E. rostrata* having attained an approximate height of 30 feet. The lignumvitæ (*Guaiacum officinale*) has characteristically developed slowly. The West Indian mahogany (*Swietenia mahagoni*) and the Honduras mahogany (*S. macrophylla*) have made very good growth, the Honduras mahogany having attained a height of 16 feet.

Trees that produce dye, perfume, oil, rubber, and the like, are grouped in a section of the arboretum devoted to such miscellaneous species. *Calophyllum calaba*, a source of oil, has made very good growth and is an attractive tree with dark, glossy green foliage. (Fig. 2, C.)

Acacia scorpioides, an important source of the gum arabic of commerce, has made good growth and flowers profusely. *Sapindus saponaria* has made good growth. *Cecropia peltata*, the hollow stems of which are used in making wind instruments, has grown rapidly and is now 14 feet high. *Hæmatoxylum campechianum*, which yields the logwood of commerce, has made satisfactory

[1] Identified by W. S. Fisher, Division of Taxonomy and Interrelations of Insects, Bureau of Entomology, United States Department of Agriculture, as *Apate monachus*. It sometimes proves to be very destructive to avocado trees.

growth. This species is widely distributed in St. Croix and at one time logwood was exported in small quantities. The tree bears flowers profusely and is valuable as a source of honey. The palm oil tree (*Elæis guinensis*) has grown slowly. *Diospyros mollis*, a member of the ebony group and source of a black dye, has not fruited as yet, but it has made exceptionally fine growth and now measures 15 feet high.

FIGURE 3.—A, Fig planting, and windbreak of *Tecoma stans* on the left; B, cane seedlings growing in seed flats

FIGS

The 3-year-old fig planting contains 40 trees. It is well protected by a windbreak of Ginger Thomas (*Tecoma stans*), which is approximately 15 feet high. (Fig. 3, A.) The soil, although typical of much of the land in St. Croix, is rather shallow for the best development of the fig. Of 32 Smyrna trees, 11 are Calimyrna or Lob Ingir, and 14 are Stanford; of 9 caprifigs, 2 are Maslin No. 70 or Bleasdale, 2 are Maslin No. 144 or Mason, 1 is Maslin No. 147

or Loomis, 1 is Maslin No. 188, and 1 is Roeding No. 7; of 6 common figs, 2 are Kodota or Dottato, and 4 are Black Mission. Of the Smyrna group, the Stanford trees average 1.5 feet higher than the Calimyrna, but the latter has set four times as many fruits as the former. In the caprifig group, Maslin No. 70 has made little growth since it was planted; Maslin No. 144 has excelled others of the group in growth and has produced a moderate number of fruits; Maslin No. 147 is represented by one badly misshapen specimen; Maslin No. 188 has made good growth but has fruited sparingly; Milco has made moderate growth but has not fruited and is evidently very susceptible to attacks of the pustule scale (*Asterolecanium pustulans*); and the single specimen of Roeding No. 7 has fruited well. In the common fig group, Black Mission is making a good showing in growth and fruit production, but Kodota is poor in every way. A severe infestation of the pustule scale was markedly reduced by a single application of a 2 per cent paraffin-oil emulsion. The fig borer (*Batocera rubus*) continues to be a serious pest. The fig wasp (*Blastophaga psenes*) has not yet been introduced for caprification and consequently fruits of the Smyrna group do not mature.

From the results so far obtained in this work it is concluded first, that the fig is at least fairly well adapted to climatic conditions in St. Croix, and second, that the most serious pest of the tree is the pustule scale (*A. pustulans*), upon the control of which the success of the fig industry in St. Croix depends.

AVOCADOS

The avocado is at home in the Virgin Islands, but the local supply is not sufficient to satisfy the demand even during the short fruiting season from August to early October. It is thought that through the introduction of new varieties the fruiting season can be considerably lengthened. Among the introductions that have been successfully established are Barker, Family, and Trapp of the West Indian class, Eaglerock, Nimlioh, and Taft of the Guatemalan class, and Gottfried of the Mexican type.

REPORT OF THE AGRONOMIST

By M. S. Baker

SUGARCANE

The total yield of sugar in St. Croix for the season 1927-28 is estimated at about 12,000 short tons. The crop occupies approximately 6,000 acres of land. Production was increased by ample rainfall during the growing season, the precipitation recorded at the station for the 16-month period, September, 1926, to December, 1927, being 71.99 inches. The sugarcane juice had an average sucrose content of 16.23 per cent.

SUGARCANE VARIETIES

Three new varieties of sugarcane from Trinidad, four from Guadeloupe, one from the Bureau of Plant Industry, United States Department of Agriculture, and one from Porto Rico, were added to the

sixty-odd varieties previously grown in the test field. In addition to these acquisitions, several others were obtained and planted in quarantine in St. Thomas, but were destroyed because of disease.

Table 4 gives the results of tests of 35 varieties ranked in the order of their merit for yield of sucrose per acre over a period of five crops.

TABLE 4.—*Comparison of yields and sugar content of 35 varieties of five cane crops* [1]

Variety	Average weight per acre	Average sucrose content of juice	Sucrose content per acre of plant cane	Average sucrose content per acre
	Tons	*Per cent*	*Pounds*	*Pounds*
POJ 228	23. 93	18. 65	2, 074. 93	3, 345. 87
Uba 1241	27. 03	17. 64	2, 920. 66	3, 265. 35
POJ 979	20. 90	17. 43	1, 600. 14	2, 967. 65
SC 22/31	17. 51	21. 46	1, 240. 94	2, 908. 98
B 147	15. 58	18. 72	972. 27	2, 844. 46
SC 12/4	16. 92	18. 91	3, 327. 52	2, 844. 13
BH 10(12)	14. 92	21. 35	1, 907. 07	2, 789. 93
POJ 234	22. 88	17. 33	1, 375. 95	2, 789. 19
B 376	16. 99	18. 42	1, 901. 10	2, 655. 52
Uba 796	21. 88	18. 05	2, 388. 77	2, 642. 56
POJ 826	14. 61	18. 74	1, 884. 14	2, 252. 25
PR 729	13. 57	17. 75	1, 222. 70	2, 126. 49
D 116	14. 21	17. 70	2, 044. 96	2, 049. 37
Ba 6032	11. 50	17. 32	1, 158. 78	2, 026. 22
Uba 797	19. 60	16. 61	2, 304. 62	1, 990. 40
Crystallina	13. 36	18. 73	1, 319. 58	1, 986. 66
B 3750	12. 17	18. 52	1, 584. 66	1, 934. 33
Kassoer	21. 29	13. 83	2, 871. 40	1, 933. 68
Jamaica	12. 22	14. 71	1, 513. 04	1, 710. 44
Ribbon	11. 19	18. 05	1, 435. 47	1, 685. 90
Ba 7924	11. 38	17. 61	1, 472. 73	1, 685. 66
SC 22/21	11. 10	19. 86	2, 183. 99	1, 602. 14
BK 6	11. 42	17. 16	2, 482. 65	1, 506. 14
SC 13/13	11. 39	18. 60	1, 540. 32	1, 473. 16
POJ 2379	9. 49	17. 34	1, 797. 50	1, 471. 95
D 1135	10. 78	16. 48	1, 480. 15	1, 459. 31
Average all X's	11. 59	18. 26	1, 634. 15	1, 426. 73
D 109	9. 60	19. 28	1, 633. 24	1, 385. 55
POJ 213	11. 85	15. 74	1, 943. 52	1, 347. 79
A 2	10. 64	17. 31	1, 429. 95	1, 297. 67
B 6388	6. 89	18. 70	2, 073. 05	1, 057. 66
BK 15	8. 28	19. 61	1, 622. 47	1, 035. 68
BK 33	8. 00	18. 54	1, 055. 30	996. 40
Gibbons No. 2	7. 56	16. 07	1, 962. 94	984. 59
White Tanna	4. 12	14. 65	1, 157. 35	495. 26

[1] The figures are averages for five crops consisting of two plant-cane crops, two first-ratoon crops, and one second-ratoon crop, grown during the period from 1925 to 1928.

In the field and laboratory comparisons Crystallina and Ribbon cane, the standard local varieties, were used as controls. Definite conclusions as to the most desirable canes for planting can not yet be drawn because factors other than yield must often be considered also. The POJ canes [2] have given good average crops over a period of years. They are healthy, vigorous canes that ratoon exceptionally well. On the other hand, the canes are slender, high in fiber, and bear masses of leaves that are not easily removed in harvesting. Table 5 gives the results from the 10 leading varieties in a first ratoon crop. A total of 59 varieties was included in this experiment.

[2] These canes originated and were developed in Java and are the results of crosses of Chunnee and Cheribon varieties.

TABLE 5.—*Comparison of 10 leading varieties of cane in a first-ratoon crop*

Variety	Weight per acre	Sucrose content of juice	Coefficient of purity [1]	Sucrose per acre
	Tons	*Per cent*		*Pounds*
POJ 979	36.54	16.96	87.86	5,331.00
POJ 228	34.30	18.38	91.90	5,043.65
SC 12/4	26.54	21.11	95.95	5,042.63
Uba 909	36.41	17.52	89.38	4,147.23
B 147	16.66	19.85	95.43	3,969.41
Uba 796	31.12	19.23	91.13	3,886.70
B 3750	22.97	18.10	94.27	3,741.87
Uba 1241	30.86	18.28	90.04	3,610.64
Uba 797	27.15	17.78	88.01	3,127.09
PR 729	18.95	17.76	87.05	3,030.29

[1] The small laboratory mill extracted only about 40.7 per cent of the weight of the cane in juice. A modern commercial mill will extract much more. At the Danish West Indian sugar factory the average juice extraction for the last 10 years has amounted to 70.36 per cent of the weight of the cane.

Table 6 gives the results from the 10 leading varieties in a second-ratoon crop.

TABLE 6.—*Comparison of 10 leading varieties of sugarcane in a second-ratoon crop*

Variety	Weight per acre	Sucrose content of juice	Coefficient of purity	Sucrose per acre
	Tons	*Per cent*		*Pounds*
POJ 234	61.84	18.02	88.76	7,354.97
POJ 228	43.62	17.78	92.12	5,274.28
SC 22/31	30.90	21.74	92.90	4,771.08
BH.10 (12)	24.06	21.54	91.65	4,354.77
B 376	26.33	18.95	93.34	3,992.23
B 147	27.50	17.92	90.50	3,893.12
Uba 796	28.38	20.21	92.28	3,556.08
Ribbon	19.50	20.04	91.92	3,249.46
B 6032	19.84	18.57	91.93	3,205.98
D 116	20.68	19.72	90.87	3,180.91

SEEDLINGS

Sugarcane seedling varieties SC 22/21 and SC 22/31 are all that remain of the 1922 series, the others having been discarded. SC 22/21 was disappointing as a ratoon cane, due probably to the fact that it is an early-maturing variety and was cut too late. SC 22/31 is giving fair yields, both as plant and as ratoon cane. It is high in sucrose but is rather reedy, short, and unsightly. All the 1923 seedlings have proved to be worthless.

Of the 1926 seedlings, 108 varieties were eliminated, leaving only 76 of the 2,000 original seedlings. SC 26/102 ranked highest in sucrose content of juice, giving an analysis of 20.35 per cent. The results are inconclusive because the amount of work involved in harvesting necessitated much time, and cutting had to be started before some of the canes were fully mature and continued after early-maturing kinds had passed their prime. On the basis of cane tonnage, SC 26/137 ranked highest of all in the 1926 seedling group, with a yield equivalent of 70.64 tons per acre. The selections made during the year from this group were determined by weight-per-stool and sucrose records.

The 1927 seedlings, of which 1,725 were planted in the field last year, have made good growth and some are fine-appearing. One hundred and eighty-one selections, based upon field characters, were made and planted in increase plats.

The 1928 group, or those grown from arrows during January of the past fiscal year, contains 819 seedlings of which 8 are the result of crossing the variety Kassoer with SC 12/4. (Fig. 3, B.)

A broad general summary of the work with new seedlings for the past three years shows a total of 4,532 seedlings raised. Of this number, 1,182 are still under observation.[3]

CULTURAL EXPERIMENTS

Spacing tests are under way to determine the effect on yield of planting at different distances. Three crops, including plant cane, first ratoon, and second ratoon, have been harvested to date from this plat. Table 7 gives the results of these three cuttings.

TABLE 7.—*Comparison of yields of cane which was planted at different distances*

Plat No.	Distance between rows	Distance between hills	Yield per acre of—			
			Plant cane	First ratoon	Second ratoon	Average
	Feet	*Feet*	*Tons*	*Tons*	*Tons*	*Tons*
1	5.00	3.0	17.28	3.10	8.50	9.63
2	5.00	2.5	14.96	4.40	11.91	10.42
3	5.00	2.0	13.65	5.70	18.32	12.65
1	3.00	3.0	14.61	8.73	20.07	14.47
2	3.00	2.5	11.60	7.85	19.58	13.03
3	3.00	2.0	18.67	9.42	23.21	17.10
1	4.00	3.0	12.88	6.85	18.24	12.66
2	4.00	2.5	13.37	5.86	17.27	12.17
3	4.00	2.0	14.97	6.80	17.82	13.08
1	4.50	3.0	12.46	5.27	15.29	10.99
2	4.50	2.5	(1)	5.91	12.12	9.02
3	4.50	2.0	(1)	6.17	14.23	10.21
1 [2]	4.75	3.0	(1)	4.85	10.84	7.86

[1] These data were lost by reason of a mistake on the part of laborers who mixed the canes from the plats at the time of cutting.
[2] This plat consisted of two rows.

A test conducted under ordinary field conditions to determine the effects of maturity as indicated by sugar content on the germinating qualities of cane gave inconclusive results. Further tests made under conditions in which the moisture content of the growing medium was under control showed that sucrose content does indicate growing quality in "seed pieces." Seed pieces analyzing 8.5 per cent sucrose resulted in a germination of 75 per cent, whereas cane containing 17.16 per cent sucrose showed a germination of only 18.6 per cent. In a general way, germinating quality is inversely in proportion to the sucrose content of the cutting.

In an experiment begun to determine the effect on yield of cane of employing an artificial manure made by the use of a proprietary compound, the artificial manure was found to show no advantage over pen manure. It did, however, compare favorably with pen

[3] The station acknowledges its indebtedness to the Danish West Indian sugar factory and to the La Grange factory for their kindness in supplying the arrows used in this work.

manure, and the process could be used to convert cane trash and other organic matter into a fertilizing material to supplement pen manure. The artificial manure and the pen manure, when applied in equal amounts per acre, gave practically the same increases over control plats that received no fertilizer.

Green-manure crops for cane lands are being tried, and rotation experiments and plant-selection work are also being conducted.

FORAGE-CROP WORK

The importance of improving the feed supply of cattle and other domestic animals is increasing yearly. The cattle industry is growing. Special need is felt for a satisfactory soiling crop or for improved grazing conditions for dairy herds during the dry summer months, when natural pasturage is short.

The activities of the year were largely of a preliminary nature and included the collection and introduction of material for future work. It is planned to give the introduced grasses a trial and to make a study of the more promising species from the present grass flora of the island. Tests of both native and introduced legumes will also be made. A grass garden, with trial plats made uniformly 10 by 20 feet, was established. (Fig. 4, A.)

GRASSES

A relatively large number of species of introduced grasses were planted in the grass garden. Some of these were obtained from the Office of Forage Crops, United States Department of Agriculture, a few including Mexican grass from the Hawaii Agricultural Experiment Station, the Java grass from the Porto Rico Agricultural Experiment Station, and others came from various other sources. Among the introduced grasses were Dallis grass (*Paspalum dilatatum*), Vasey grass (*P. larranagai*), Bahia grass (*P. notatum*) (fig. 4, B), molasses grass (*Melinis minutiflora*), Jaragua grass (*Andropogon rufus*), centipede grass (*Eremochloa ophiuroides*), Napier grass (*Pennisetum purpureum*), and its variety Merker grass, Kikuyu grass (*P. clandestinum*), Mexican grass (*Exophorus unisetus*), Java grass (*Polytrias amaura*), Igoka grass (*Capriola dactylon*), Guatemala grass (*Tripsacum laxum*), Sudan grass (*Andropogon sorghum sudanensis*), orchard grass (*Dactylis glomerata*), tall meadow oatgrass (*Arrhenatherum elatius*), meadow fescue (*Festuca elatior*), Kentucky bluegrass (*Poa pratense*), and *Agrostis stolonifera*. The five last-named species failed completely. Grass species collected from pastures and other natural growth in St. Croix and planted in the grass garden are Para grass (*Panicum barbinode*), ten per cent grass (*P. reptans*), *P. adspersum*, guinea grass (*P. maximum*), *Paspalum fimbriatum*, Dutch grass (*Eleusine indica*), *Leptochloa filiformis*, crucifixion grass (*Echinochloa colonum*), Barbados sour grass (*Amphilophis ischaemum*), long grass (*Valota insularis*), crabgrass (*Syntherisma sanguinalis*), bay grass (*Capriola dactylon*), *Chloris paraguaiensis*, and smut grass (*Sporobolus indicus*).

Guinea grass is the principal source of feed for both dairy and work animals in the Virgin Islands. It has a high feeding value, even when cut in the dry season when it has become partly cured

and closely resembles hay. Guinea grass, Para grass, Merker grass, and Uba cane might be recommended in the order named for use as soiling crops. Sudan grass planted January 16 produced in a season of four and one-half months 5 tons of good green feed per acre. This crop was grown during the dry season. Igoka grass, a form of giant Bermuda grass, Jaragua grass, Barbados sour grass, and molasses grass are making satisfactory growth and deserve further trial.

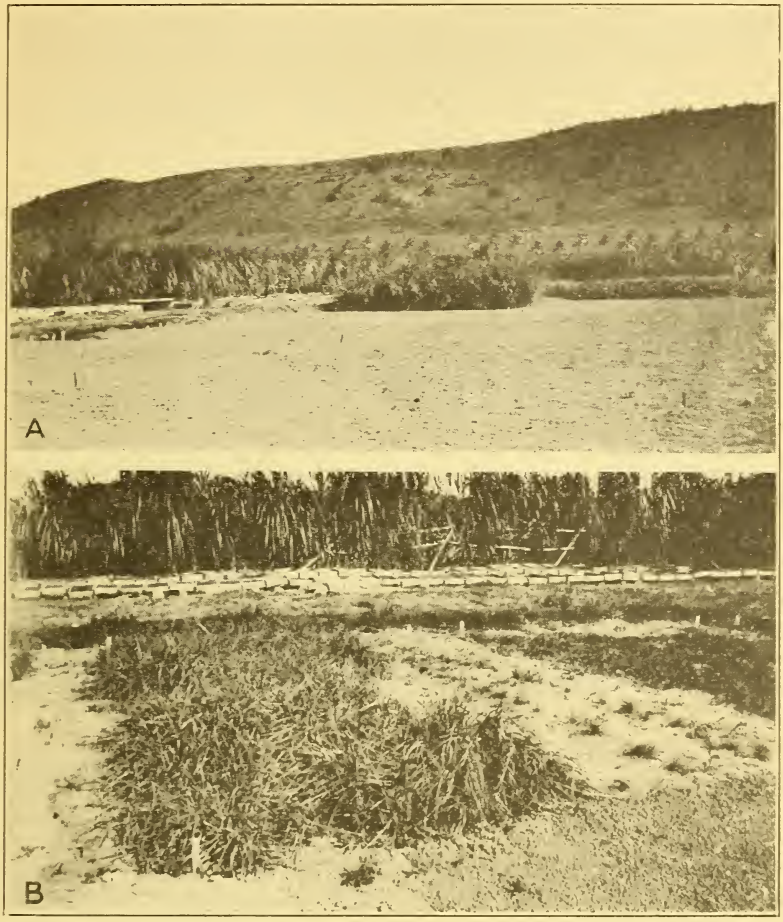

FIGURE 4.—A, Grass garden plats ready for planting; B, Bahia grass (*Paspalum notatum*), seven months from seed

Dallis grass made good growth but was affected by dry weather. Practically all the so-called native grasses that were planted in the grass-garden plats died down during the dry season.

LEGUMES

Soybeans, planted in January at the beginning of the dry season, failed to produce a crop. A planting made in the wet season was only partly successful. Of the 11 varieties planted, Biloxi made the

most vigorous vegetative growth, but Tarheel and Tokio gave the highest yields of seed. Tarheel produced seed at the rate of 762 pounds per acre, and Tokio at the rate of 707 pounds on a similar area.

The cowpea varieties Morado, Blanco, Bayo, and Negro, which were introduced from Porto Rico, and Groit from the United States Department of Agriculture, made good growth. Bayo and Groit made the heaviest crop of seed. Seventeen varieties, including those mentioned above, were planted during the dry period, but gave indifferent results. Vetch, clovers, and alfalfa did poorly, but of the latter the Hairy Peruvian variety made the best development. The pigeon pea made good growth and is useful as a green-manure crop and for food. Several varieties of this important legume were obtained through the courtesy of O. W. Barrett of Porto Rico.

The jack bean (*Canavalia ensiformis*) grew well. Velvetbeans (*Stizolobium* sp.) made excellent growth in wet weather and proved to be fairly successful when grown in the dry season. Sunn hemp (*Crotalaria juncea*) produced a heavy crop of vegetable matter in the wet period, but failed to set seed. When planted in January and grown in the dry weather, the plants grew to a height of only 4 feet, but they produced a crop of seed. In tonnage of green matter, sunn hemp ranks first among the legumes tested when grown in the dry summer season. The mung bean and the beggarweed deserve further trial.

SORGHUMS

Thirteen varieties of sorghum were planted as dry-weather crops. They reached an average height of 5 feet and produced good sound seed and a fair crop of fodder. White-seeded "chicken corn" led feterita, yellow milo, white kafir, Redtop or Sumac sorghum, Sourless sorghum, Texas-seeded Ribbon cane, Early Orange sorghum, Saccaline sorgo and Early Amber with 5.09 tons of green feed per acre. Earlier harvesting of this crop would probably have resulted in an increased yield.

Dwarf Essex rape, planted January 1, 1928, grew during the dry season and produced 10 tons of green feed per acre by April 15. It was still growing at that time.

REPORT OF THE AGRICULTURIST FOR ST. THOMAS AND ST. JOHN

By W. M. Perry

The extension work, started in St. Thomas and St. John a year ago and mentioned in the last annual report, was continued along the same general lines. Notwithstanding the difficulties encountered in the inauguration of this work, it is already taking hold and a solid foundation is being laid for the agriculture of the future. During the year approximately 300 persons called at the extension office for information on matters pertaining to the farm and to the home. A supply of bulletins dealing with agricultural topics is kept for distribution to those requesting them. Although the extension office is maintained principally for the dissemination of agricultural information, many personal visits to the farmers are necessary also. During the year 145 such visits were made at the request of as many planters for practical instructions on definite farm problems.

One of the more important problems attacked during the year was that of shipping vegetables for marketing in New York. As this work is still in the experimental stage only small-scale plantings were recommended. The original plan contemplated the planting of tomatoes only as a commercial crop in St. Thomas (fig. 5), and of specializing with Bermuda onions in St. John where previous onion plantings had been very successful. Unfortunately, the onion seed obtained proved to be worthless, with consequent loss of an entire season's work. The tomatoes produced well in St. Thomas and the product was graded and packed in standard 6-basket carriers. Grading bins, built in sections and designed by the agriculturist, served the purpose admirably. (Fig. 6, A, B.) This type of bin is of advantage because only as many sections as there are grades need be set up, and these sections can be taken down quickly and stored in small quarters. Soon after the packing season opened it was discovered that the market was being demoralized

FIGURE 5.—Cultivating tomatoes in St. Thomas

by unusually heavy shipments from Florida and foreign countries. Shipments were, therefore, discontinued and sales were confined to the local market and to visiting ships. Fortunately, these sales more than paid the expense of producing the whole crop and overbalanced the loss on the 103 crates shipped. Because of the great uncertainty still prevailing relative to the produce market for the coming year, the planting of truck crops for export will continue only on a small scale.

As a result of different influences the production of vegetables for home consumption is increasing. The importance of the more liberal use of vegetables in the dietary is being taught, and planters are acquiring a knowledge of varieties that are best suited to local conditions. The school-garden clubs are also highly instrumental in stimulating vegetable production. In the club work seed is furnished by the agriculturist without cost and the young members are instructed in the proper methods of planting and cultivating their crops. At club meetings reports are made, the results of ex-

periences are exchanged, and problems are discussed. The good effects of this work are not confined to the children, but are often reflected in the better farming practices of their parents.

Maximum results in local agricultural development demand a transition from the primitive methods now in vogue to more modern practices. To this end, a cultivator was obtained and used in the school gardens and elsewhere during the year. It attracted con-

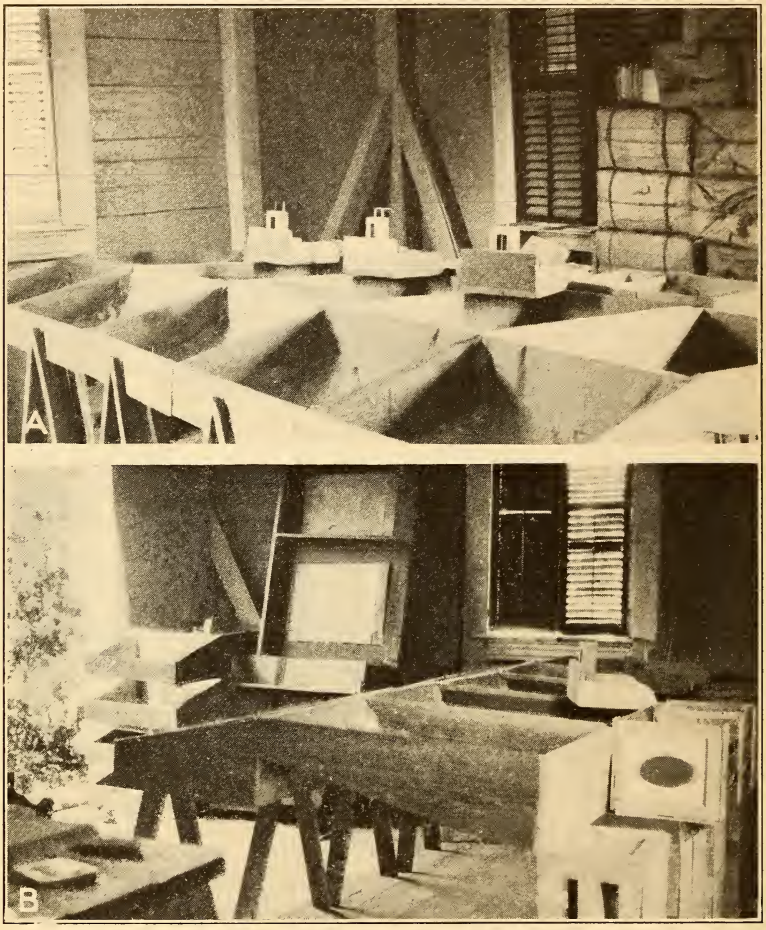

FIGURE 6.—A, Sectional grading bin for tomatoes, front view; B, back view

siderable attention and apparently won friends. Funds have been secured to purchase a team and plowing equipment to plow the land at cost for those desiring this service.

SIRUP MILLS

Sugarcane has been raised for many years in a small way and used or marketed for chewing both in St. Thomas and St. John, but its value for making sirup was not appreciated until recently. Plans

to establish community sirup mills are being considered. Such a mill has been operating in St. John during the past year and a similar one is to be installed in St. Thomas during the coming season. The value of cane sirup as an addition to the dietary of the people is obvious.

MUNICIPAL NURSERY

A municipal nursery, established with funds provided by the local Government, is being developed. A water system was installed during the year. Clearing and fencing the land is under way and thousands of seedlings of timber, fruit, and ornamental species are being started. A large number of vegetable plants were distributed during the year and much work of an experimental nature is being done.

TOURIST EXHIBITS

A well-arranged exhibit of the farm products of the islands was prepared pending the arrival of each tourist ship in St. Thomas during the tourist season. These exhibits attracted much attention and many inquiries were made concerning farm possibilities in the Virgin Islands.

TREE SURGERY

During the relatively inactive farming period of the dry season attention was given to the problem of preserving the trees in the parks, roadways, and streets. Many of these belong to the mahogany species, *Sweitenia mahagoni*. Injuries caused by hurricanes have been followed by decay with the passing of time. A workman has been trained to do this work with a minimum of supervision. The treatments given not only improve the appearance of the trees but prolong their lives.

MISCELLANEOUS ACTIVITIES

In addition to his regular duties, the agriculturist cooperated with the department of education in its school-garden work, prepared timely articles on agricultural topics for local publication, and traveled 433 miles in making farm calls, attending agricultural meetings, and to other business connected with the extension work.

METEOROLOGICAL OBSERVATIONS

By A. Bisserup

The unusual summer rains of the last months of the preceding fiscal year had a greater stimulating influence on sugar production for the current year than had weather conditions in 1928. The rainfall records for the present year well illustrate the fact that good sugar crops depend more on the timely distribution of rain than on the total amount. The rainfall is often very light from December to June—a critical season in the life of cane that is to be cut in the following year. The area to be planted depends to a large extent upon moisture conditions at this time, and ratoon crops demand a reasonable amount of soil moisture following the spring harvest period. It will be noted that while the total rainfall for the year was 46.91 inches, or just about normal, the sugar crop is about 12,000 tons, or well above

average. The precipitation for 1927 totaled 48.05 inches, or a little more than that for the current year, but the sugar crop was only about 7,000 tons. Light rains during the summer of 1928 point to reduced sugar yields in 1929.

The absolute maximum temperature of the year, 92° F., was recorded September 1, 12, 13, 16, and 19, 1927, and the absolute minimum, 59°, was recorded December 21, 1927. Table 8 gives a summary of the meteorological data for the year.

TABLE 8.—*Condensed meteorological data for the Virgin Islands Experiment Station for the fiscal year ended June 30, 1928*

Month	Temperature		Total rainfall	Average daily velocity of wind	Monthly evaporation
	Maximum	Minimum			
1927	° F	° F	*Inches*	*Miles*	*Inches*
July	87.9	74.0	6.03	31.5	3.139
August	88.5	73.1	3.71	22.8	5.775
September	90.2	73.3	8.09	14.5	4.358
October	88.3	73.1	9.16	17.7	5.657
November	85.9	72.0	6.03	29.0	3.407
December	84.1	68.1	1.42	34.1	[1] 1.950
1928					
January	84.2	69.5	1.91	39.0	(1)
February	84.3	70.1	1.86	34.7	(1)
March	85.0	70.2	2.77	40.9	5.262
April	85.0	71.0	2.01	37.0	7.327
May	87.7	73.3	2.40	30.5	6.473
June	89.8	74.8	1.52	36.8	6.766
Mean			46.91		50.114

[1] During this period the evaporation tank leaked, hence the inaccuracy or absence of records.

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